

Appl. No. 09/624,092
Amendment and/or Response
Reply to Office action of 25 March 2004

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REMARKS / DISCUSSION OF ISSUES

Claims 1-20 are pending in the application. Claims 19 and 20 are newly added.

The Examiner is respectfully requested to state whether the drawings are acceptable.

New claims 19 and 20 are added to particularly point out and distinctly claim the subject matter that the applicants regard as the invention. No new matter is added.

The Office action rejects claims 1-18 under 35 U.S.C. 103(a) over Liu et al. (USP 6,134,514, hereinafter Liu) in view of Borella et al. (USP 6,442,141, hereinafter Borella), Markus (USP 5,561,841), or Harald et al. (USP 6,466,925, hereinafter Harald). The applicants respectfully traverse this rejection.

The Office action also requested the applicants' consideration of the prior art made of record. The applicants acknowledge that James et al. (USP 5,701,439) is relevant to the patentability of claims 1-15. Independent claims 1 and 10 are correspondingly amended herein. The following remarks address the distinguishing features of the applicants' invention with regard to the combination of James, Liu, Borella, Markus, and Harald.

The applicants teach a particular means of combining discrete simulation with analytic simulation to expedite the analysis of select traffic flow across a complex network. The select traffic flow of interest is defined as "explicit-traffic"; all other traffic flow in the network is defined as "background-traffic". To minimize computations, the background-traffic is analyzed/simulated using analytic techniques, which consume significantly less computation resources than discrete-event simulation. To determine the particular effects of network congestion, protocol handling, and other factors, on the traffic flow of interest, discrete-event simulation is performed for the explicit traffic. Such a combination of analytic simulation and discrete-event simulation is defined as mixed mode network simulation.

Neither Liu, Borella, Markus, nor Harald teach or suggest mixed mode network simulation. In particular, Liu teaches that "Simulations can be classified into three types: continuous time [analytic], discrete time, and discrete event. The specific type of simulation

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described herein within the context of the present invention is known as discrete event simulation. That is, simulations where system state changes occur, in response to applied stimuli, at discrete points in time" (Liu, column 2, lines 34). Borella also teaches discrete event simulation (Borella, column 9, lines 14-34). Markus apparently teaches a discrete event simulation (Markus, column 5, line 13 through column 7, line 30). Harald teaches a neural network process that improves discrete-event simulation by processing prior-seen events via the neural network, "so that the simulator only needs to be used for "new" situations" (Harald, column 5, lines 8-18, and FIGs. 1 and 2). Harald distinguishes between foreground and background traffic, but the simulation techniques employed for each is similar (Harald, column 5, lines 11-30, and FIG. 3).

James, on the other hand, does teach mixed mode network simulation, comprising analytic and discrete-event simulation, comprising continuous model processes and discrete-event processes (James' FIG. 1). However, James does not teach an integration of analytic and discrete-event simulation via the generation of implicit events in the discrete event simulator based on the continuous model process, and does not teach the optimization of the discrete event simulation by providing the generation of the implicit events based on the occurrence of explicit events, as taught and claimed by the applicants.

As taught by James, each of the processes includes an associated local scheduler that queues events to be simulated by that process. As also taught by James, the simulator includes a global scheduler that serially links each of the queues in the system (James' FIG. 6). Of particular note, the analytic simulation is substantially independent of the discrete-event simulation: "[t]he architecture of the tool permits the use of mixed language models, wherein each model functions as a separate process" (James' column 2, lines 56-66). Thus, for example, the analytic simulation will be performed regardless of whether any discrete-events are modeled or simulated.

In the applicants' claimed invention, implicit-events are generated based on the background traffic, and this generation of implicit-events from background traffic is dependent upon the generation of explicit-events.

Because neither James, nor Liu, nor Borella, nor Markus, nor Harald, individually or collectively, teach or suggest the generation of implicit-events from background traffic in

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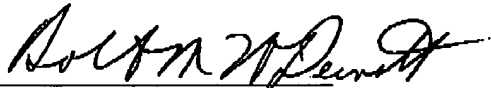
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dependence upon the occurrence of explicit-events, as specifically claimed in each of the applicants' independent claims 1, 10, 19, and 20, the applicants respectfully request the Examiner's reconsideration of the rejection of claims 1-15 under 35 U.S.C. 103(a), and favorable consideration of newly added claims 19 and 20.

With regard to claims 16-18, the cited prior art does not teach or claim an analytic modeling process wherein a performance parameter of the network is based on a stochastic process having the first set of stochastic traffic parameters during a first time duration, and having the second set of stochastic traffic parameters during a second time duration. Therefore, the applicants respectfully request the Examiner's reconsideration of the rejection of claims 16-18 under 35 U.S.C. 103(a) over Liu, Borella, Markus, and Harald.

In view of the foregoing, the applicants respectfully request that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application to be in condition for allowance. If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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